



MMD
EQUIPMENT™

OWNER'S MANUAL

GENERATOR / WELDER

NGW-190H

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NGW-190H Gen-Welder

Heavy duty, butt welded rectangular roll cage

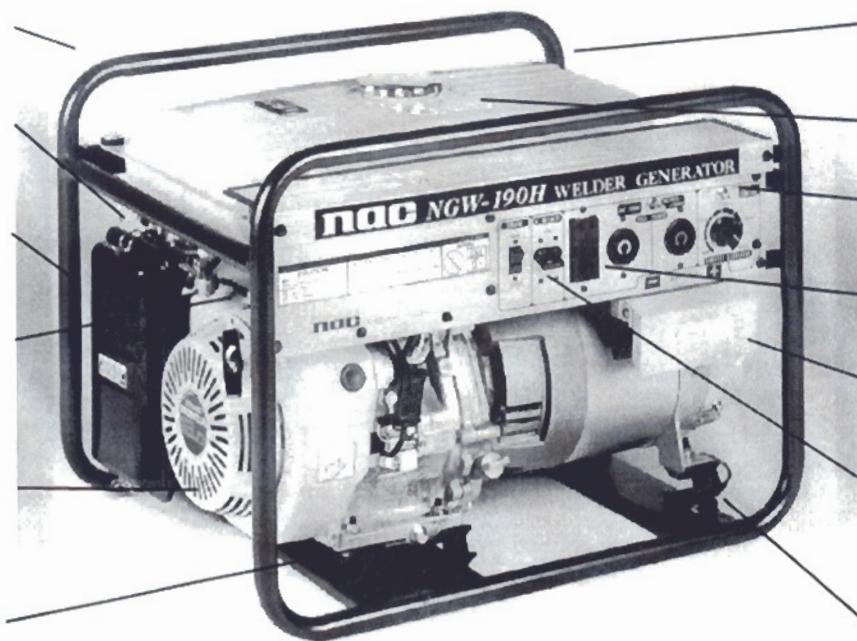
Vacuum Assisted Automatic Choke

Large air filter for longer engine life

Idle control reduces fuel consumption and engine wear

Honda OHV with auto decompression and electronic ignition

Oil Alert protects the engine



Large super silent muffler

All Day Steel Gas Tank

Full power switch, 120V or 120/240V use

120V GFCI's protect from tool shock

Shielded welding lugs

Electro Magnetic Breakers stop generator and tool burn out from overloads

6 heavy duty vibration isolators

The NGW-190H offers true versatility for the contractor or rental yard. This simultaneous use AC (120/240V) / DC (50-180A) generator / welder is designed for reliable output in tough construction jobs. Advance technology allows for the more compact design and lighter weight that can withstand the rigors of the job site, day and night. Automatic Voltage regulation and 100% copper windings provide consistent power, full output for motor starting and the ability to withstand the surges caused by electric motors and tools.

The DC welder offers an excellent open circuit voltage for superior welding. The shielded lugs allow easy access and extra protection. The adjustable, stable voltage output makes this welder ideal for a broad range of applications.

Designed for reliability, the steel fuel tank, weather proof control box, butt welded double rectangular frame and 6 heavy duty diagonal vibration isolators offer investment protection.

Deluxe features like the full power switch, low oil shutdown, panel mounted on/off switch, in tank fuel gauge, large easy fill opening with filter, all assure you of easy operation and extended life.

Model	NGW-190H
AC Voltage (V)	120/240V
Max AC output (W, A)	3,800W / 31.7A
Rated AC ^{Output} (W, A)	3,300W / 27.5A
DC output (V)	55V Open Circuit Voltage
DC Amps	50-180A
Duty Cycle	40%
AC Outlets	1 x 120V, 20A GFCI 1 x 120V, 30A Twist Lock 1 x 240V 20A Twist Lock
DC Output	3/8" Lugs with Wing Nuts
Engine	Honda GX-390
Horse Power	13.0 HP
Tank Capacity (G)	4.5 G
Run Time (at rated load)	5.2 H
Auto Idle Control	Yes
Dimensions (LxWxH)	26.4 x 20.1 x 19.5
Dry Weight (Lbs)	188

STARTING THE NGW-190H GEN/WELDER

READ HONDA ENGINE OWNER'S MANUAL BEFORE OPERATING GEN/WELDER

- 1) Place generator on a stable and level surface.
- 2) Inspect engine for oil or gas leaks.
- 3) Check engine oil. (See Honda engine owner's manual)
NGW-190H uses a 13hp Honda GX-390 engine. (Oil capacity is 1.16 U.S. quarts)
- 4) Fill fuel tank with fresh, clean, unleaded gasoline (4.5 gallons)
- 5) Check gen/welder control panel. Circuit breakers should be "off", idle control switch should be "off", and on-off switch should be "on."
- 6) Turn fuel cock to the open position (lever is vertical)
- 7) Pull choke lever out (choke is on with lever pulled out)
- 8) Pull starter grip lightly until you feel resistance. Return the grip gently to its original position, and then pull briskly. Return the grip gently. Repeat this process until the engine starts.
- 9) Push choke lever inward (choke is off)
- 10) Allow the engine to run for 3-5 minutes before connecting any equipment or welding.
- 11) Place circuit breakers in the "on" position.

USING A.C. RECEPTACLES

READ HONDA ENGINE OWNER'S MANUAL BEFORE OPERATING GEN/WELDER

- 1) Check pilot lamp is illuminated.
- 2) Ensure all appliances are turned off before connecting them to the generator.
- 3) Insert appliance plugs into receptacles on generator.

- Check the amperage of the receptacles being used and be sure not to exceed that amperage
 - GFCI 20 amps of 120V
 - NEMA L14-10R 10 amps of 240V (four-pronged locking receptacle)
 - NEMA L5-30R 30 amps of 120V (three-pronged locking receptacle)

NOTE ON OPERATION OF THE FULL-POWER SWITCH:

When the full-power switch is placed in the "AC 120/240" position, only half the rated current may be drawn from the 120V receptacles, while all the rated current may be drawn from the 240V receptacle. When the full-power switch is placed in the 120V position, all the rated current may be drawn from each of the 120V receptacles, but no current may be drawn from the 240V receptacle.

NOTE:

When the circuit breaker trips during operation, the generator is overloaded or the appliance is defective. Turn the generator off immediately and calculate the total wattage being used.

(voltage x total amperage = wattage)

The rated A.C. output varies from 600W to 3300W depending on the D.C. amperage being used simultaneously.

- ◆ **Rated A.C. output if not welding is 3300W**
- ◆ **Rated A.C. output while welding at 180A simultaneously is 600W**

For example:

The full power switch is in the 120V/240V position, and the generator is being used to power a 5A appliance from the GFCI and a 10A appliance from the 240V receptacle.

Wattage consumed from GFCI is: $5A \times 120V = 600W$

Wattage consumed by the 240V receptacle is: $10A \times 240V = 2400W$

Total wattage consumed is: $600W + 2400W = 3000W$

If the total wattage exceeds the rated A.C. output of the gen./welder (see above), reduce the number of tools being used, or use a larger generator. If the total wattage does not exceed the rated A.C. output of the gen./welder, check the appliances for shorts. If all appliances test normal, take the gen/welder to an authorized service center for repair.

PRECAUTIONS FOR D.C. WELDING

READ HONDA ENGINE OWNER'S MANUAL BEFORE OPERATING GEN/WELDER

1) Electric shock is extremely dangerous! Please adhere to the following precautions.

- a) Wear protective clothing such as welding gloves, welding apron, and face shield. Filter lens should conform to ANSTI Z87.1 Standard.
- b) Damaged welding cables may cause shorting to occur, or electrical shock to personnel. Always inspect cables for damage before connecting them to the welding lugs!
- c) Never touch welding lugs while engine is running!
- d) Always ensure the protective cover over the welding lugs is closed whenever the engine is running!
- e) Never operate the gen/welder in any wet area!

2) Fumes from engine and welder are noxious and may cause sickness or even death!

- a) Avoid breathing fumes from engine and welder.
- b) Ensure adequate ventilation near gen/welder, especially when welding on galvanized lead or cadmium-plated steel and other metals that produce toxic fumes.

3) Avoid circumstances that could cause fire or explosion!

- a) Keep the area clear of combustible material. Sparks from welding can ignite flammables.
- b) Do not weld and heat drums, tanks, or any enclosed containers unless precautions have been taken to keep fumes from concentrating inside.
- c) Keep approved fire extinguishers readily available when welding.

USING D.C. OUTPUT FOR WELDING

READ HONDA ENGINE OWNER'S MANUAL BEFORE OPERATING GEN/WELDER

NOTE:

To avoid serious injury, never connect welding cables while engine is running!

1) Select the proper cables using the guidelines below.

The required cable size is determined by the amount of amperage used when welding and the length of cable to be used. The longer the length of cable (or the higher the welding current), the larger the diameter of the cable must be.

Current (A)	Length (ft.)	50	100	125	150	200	250	300
100		#3	#3	#3	#3	#3	#3	#2
150		#3	#3	#3	#3	#2	#1	#1
180		#3	#3	#3	#2	#1	#1/0	#1/0

2) Select the polarity of welding cables

The polarity, positive (+) or negative (-), is indicated at the welding lugs on the control panel. Select the polarity according to the appropriate welding application.

Polarity	Connection method	Application
Electrode positive	+...Grounding (base metal) -...Electrode holder	Welding structural steels or thick plates
Electrode Negative	+...Electrode holder -...Grounding (base metal)	Build-up welding Arc welding thin plates Arc welding stainless steel

3) Duty cycle for NGW-190H gen./welder.

This welder is not designed to withstand continuous welding. To avoid overloading the gen./welder, adhere to the appropriate duty cycle. Duty cycle is a percentage of a 10-minute period of time.

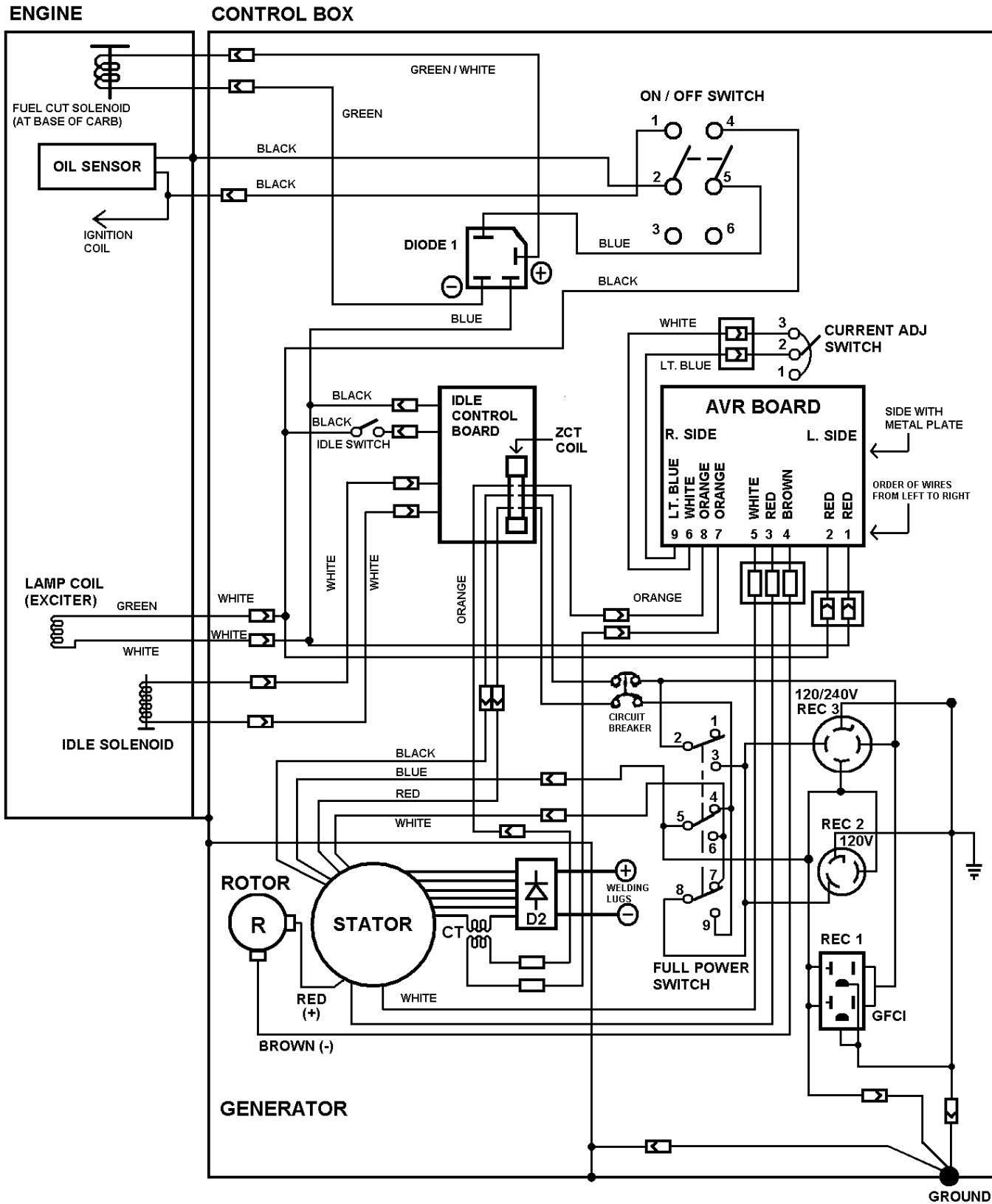
Welding current (A) 110 or less 120 140 170 190

Duty cycle (%) 100 80 60 50 40

Example: If the duty cycle is 40%, you can weld up to 4 minutes in a 10-minute period.

NGW-190H

Full Power Sw (UP) = 120V / 240V
Full Power Sw (Down) - 120V only



NGW190H WELDER

TROUBLESHOOTING

GUIDELINES

1. First, verify the engine rpm is set to 3750 rpm at no-load.
2. Then check the lamp coil from the Honda engine (0.36W ~ 0.46W). This coil provides the initial excitation voltage for the generator / welder (pages 8-2 and 8-6 of the Honda shop manual for the GX-390 engine).
3. Next, check the brush length; they must be longer than 5 mm. If the brushes are less than 5 mm long, the brush holder must be replaced. Brushes should also move smoothly in and out of the brush holder.
4. Ensure the brushes are smooth and the slip rings on the rotor are also clean and smooth.
5. Measure the resistance between the two, slip rings on the rotor. It should be between 7.1 Ohms ~ 7.2 Ohms. If the resistance is outside these parameters, replace the rotor (Ensure your readings are accurate!).
6. Measure the resistance of the stator coils. See attached pages. If the resistance is outside these parameters, replace the rotor (Ensure your readings are accurate!).
7. Test AVR.
8. Your multi-meter must be very accurate (to 0.01W). You must also determine the resistance in your meter leads by holding the tips of the leads together and recording the value from your meter (probably 0.1 W or 0.2 W). Subtract this value from all test values read on the meter display.

NGW190H WELDER

COMPONENT CHECKS

ROTOR

1. From one slip ring to the other -7.5 ohms
2. From each slip ring to the bobbin - Infinity

CURRENT TRANSFORMER

1. Should get a reading of- 57 ohms

STATOR

1. Red to brown brush leads - Infinity
2. Red to white - 0.3 ohms
3. Black to blue - 0.3 ohms
4. Between red/white and black/blue - Infinity
5. **Three-wire plug**
 - A. Red to white - 0.3 ohms
 - B. Red or white to brown - Infinity
 - C. Red to red brush lead - 0 ohms
 - D. Brown to brown brush lead - 0 ohms
 - E. Brown to any lead - Infinity

DC LEADS

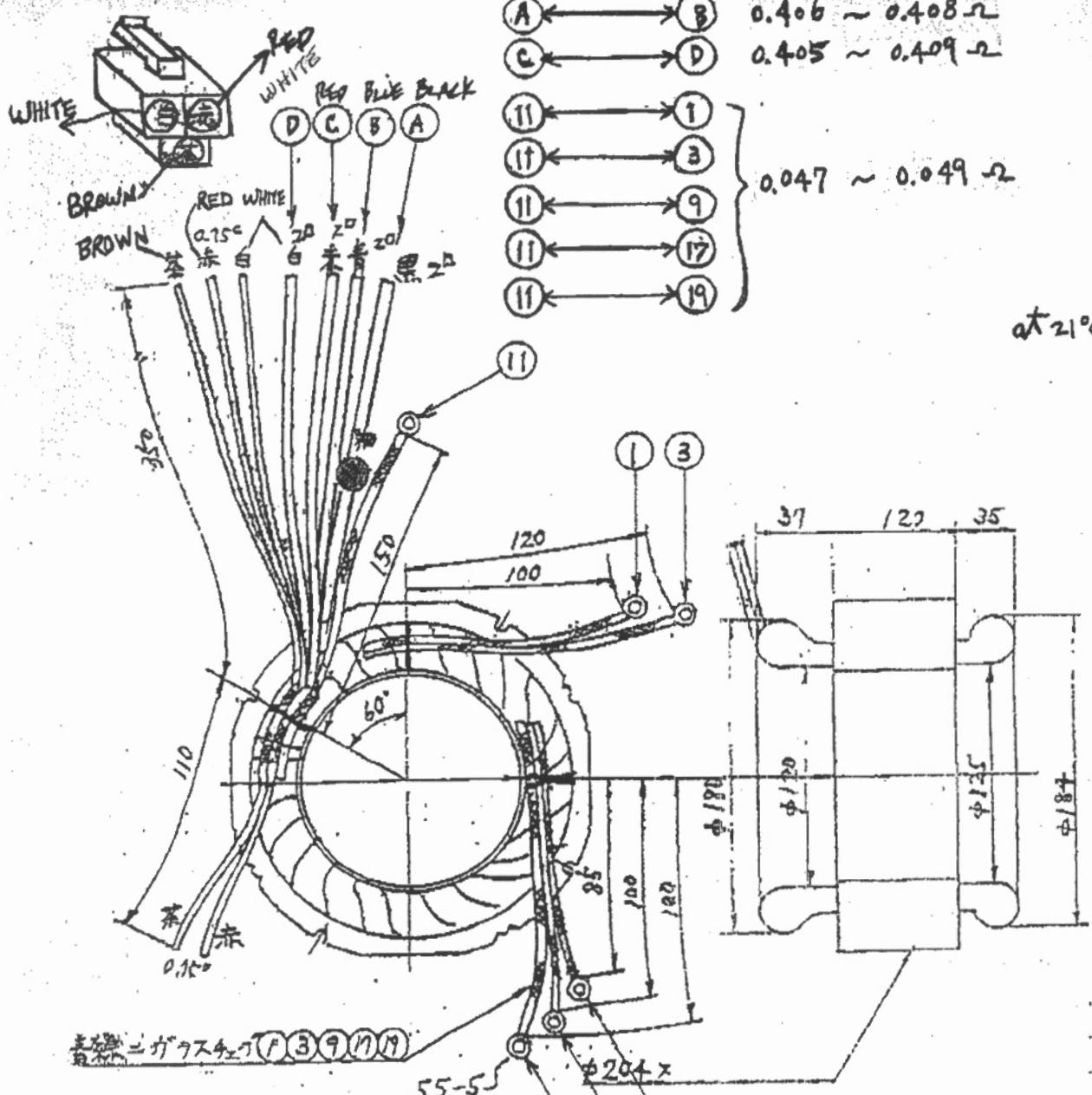
1. Red to red test lead & Black to black test lead -1.08 to 1.3 Mg-ohms
2. Red to black test lead & Black to red test lead - 63.5K ohms

DIODE BLOCK

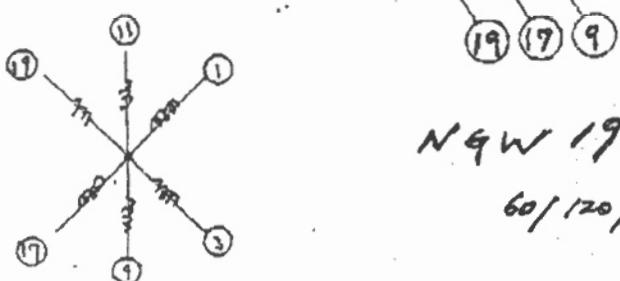
1. AC terminals to Minus- Black test lead on AC terminal and Red test lead on Minus - 5.9K ohms
2. Red test lead on AC terminal and Black test lead on Minus - 1.7 Mg-ohms.
3. Black test lead on AC terminal and Red test lead on Plus - 1.7 Mg-ohms.
4. Red test lead on AC terminal and Black test lead on Plus - 5.9K ohms
5. Black test lead on Plus and Red test lead on Minus - 70Kohms
6. Red test lead on Plus and Black test lead on Minus - 2.0 Mg-ohms

STATOR RESISTANCE VALUES

6
6



STATOR CP



NGW 190H

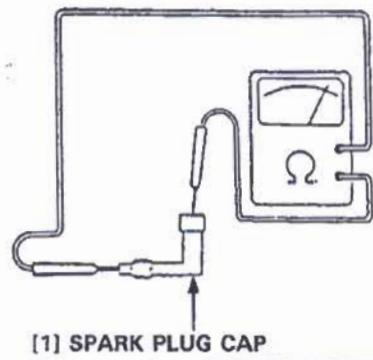
60/120/24.0

• SPARK PLUG CAP

Measure the resistance of the spark plug cap by touching one test lead at the wire end of the cap and the other at the spark plug end.

Resistance	7.5 – 12.5 k Ω
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Replace the spark plug cap if the resistance is not within the range specified.



• LAMP COIL

Measure the resistance between the wire terminals.

	Resistance
6 V – 25 W	0.21 – 0.27 Ω
12 V – 25 W	0.36 – 0.46 Ω

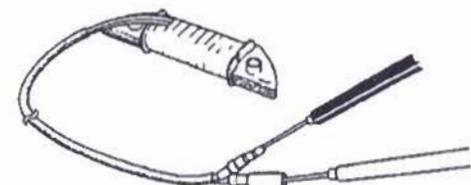
NOTE

- Refer to P.13-2 to properly identify the lamp coil before testing.

• CHARGE COIL (Model with electric starter)

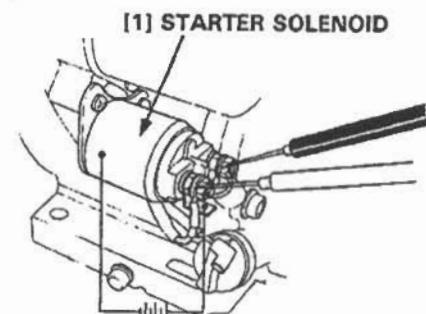
Measure the resistance between the wire terminal and ground.

Resistance	3.0 – 4.0 Ω
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• STARTER SOLENOID

Connect a 12V battery between the starter terminal and the solenoid body and check for continuity between the terminals. Continuity should exist when the battery is connected and not exist when the battery is disconnected.





FLYWHEEL, IGNITION COIL, STARTER MOTOR

a. DISASSEMBLY/REASSEMBLY

<GX240K1, GX270>

STARTER MOTOR EQUIPPED TYPE:

Measure starter performance while cranking the engine.

If performance is not within service limits, disassemble and inspect as described on pages 8-4.

GX240K1, GX270:

	Under load	No load
Cranking voltage	9.7VDC	11.5VDC
Cranking current	Below 80A	Below 31A
Engine cranking speed	More than 393 min ⁻¹ (rpm)	

[1]

BLACK WIRE

REASSEMBLY:

Insert securely into the two ribs on the crankcase as shown.



[12]

WOODRUFF KEY

REASSEMBLY:

After installing the flywheel, check to be sure that the woodruff key is still in its slot on the crankshaft.

[10]

HIGH TENSION CORD

REASSEMBLY:

Check for cracked or damaged insulation; replace if necessary.

[8]

COOLING FAN

CAUTION:

When disassembling and reassembling, take care not to damage the fan blades.

REASSEMBLY:

Attach by aligning the three lugs on the rear side of the fan with the small holes in the flywheel.

[3]
CHARGE COIL

INSPECTION:
P.8-6

[11]

SPARK PLUG CAP

INSPECTION: P.8-6

[9]
IGNITION COIL

INSPECTION/ADJUST-
MENT: P.8-5

[8]-1 [8]-2
FLYWHEEL COOLING FAN

[8]-3
ALIGN

[8]-5
HOLE

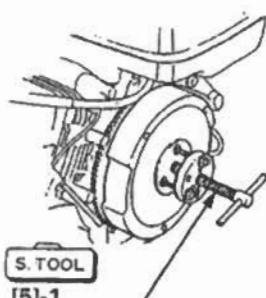
6 x 28 (2)

[8]-4
LUG

[5]
FLYWHEEL

DISASSEMBLY:

- Remove the ignition coil before removing the flywheel.
- Do not hit the flywheel with a hammer. Remove with the special tool.



S. TOOL

[5]-1
FLYWHEEL PULLER
07935-8050002

REASSEMBLY:

Clean the crankshaft tapered surface before installation.

* WIRES EXIT
ENGINE HERE

[7]
STARTER PULLEY

REASSEMBLY:

Align the hole of the starter pulley with the boss of the cooling fan.

[6]

16 mm FLANGE NUT

TORQUE:

115 N·m (11.5 kg·m, 83 ft·lb)

DISASSEMBLY/REASSEMBLY:

- Apply oil to the thread.
- Hold the flywheel by placing screwdriver into the pulley.

9. TROUBLESHOOTING

- When the engine starts but unable to weld or generate power.

Phenomenon	Cannot weld or use the auxiliary power supply.						
Subject parts	Initial exciting coil mounted on engine	Stator CP	Rotor CP	Diode module	Brush holder Assy	AVR Assy	Wiring
Possible cause	Broken wire or shortcircuit	Broken wire or shortcircuit	Broken wire or shortcircuit	Shortcircuit	Abnormal wear or poor connection	Defective Assy	Broken wire
Inspection	Remove T coupler of red wire from AVR Assy and check the voltage with a circuit tester.	Measure the resistance between respective lead wires.	Measure the resistance between slip rings with a circuit tester.	Check resistance values of diodes, 6 pcs., on the module.	Removing the brush holder Assy, measure the dimension of brush which is protruding from the holder face, with vernier calipers.	Replace with a new AVR Assy and check the result.	Check the resistance value on each lead wire with a circuit tester.
Judgement	It is normal if the voltage is higher than AC 12V. If not, it is abnormal.	It is defective if the resistance differs larger than $\pm 10\%$ of standard value.	It is defective if the resistance differs larger than $\pm 10\%$ of standard value.	It is acceptable if it is within the standard value in the normal direction and infinite in the reverse direction. If is defective if even one of them is not indefinite in the reverse direction.	It is good if the brush extrudes more than 5 mm. It is defective if it is less than 5 mm.	If it operates properly, the unit before replacement is defective.	It is good if there is continuity between respective lead wires. It is defective the resistance is infinite.
Countermeasure	Initial exciting coil replacement	Stator CP replacement	Rotor CP replacement	Diode module replacement	Brush holder Assy replacement	AVR Assy replacement	Lead wire repair or replacement

- Engine can be started but unable to weld or generate power.

Phenomenon	Slow-down unit does not function.							
Subject parts	Load at AC output side	Solenoid unit	Slow-down unit	Slow-down switch	Welding cable	Slow-down circuit fuse	Wiring	
Possible cause	Load is connected to the power outlet	Broken coil	Defective slow-down unit	1. Defective contactor 2. Switch lever OFF	Shortcircuit on cable	Fuse	1. Broken wire 2. Miswiring	
Inspection	Check for any equipment, tool, etc. connected to AC output side.	Check the resistance with a circuit tester.	Replace with a new slow-down unit.	1. Check for continuity with a circuit tester. 2. Check the switch lever position.	Visual inspection. Check for contact between welding holders.	1. Visual check 2. Continuity check on the fuse with a circuit tester.	1. Continuity check with a circuit tester. 2. Check if the wiring is passed through ZCT of slow-down unit.	
Judgement	It is not good if any load is connected.	It is defective if the resistance is infinite.	If it operates properly, the unit before replacement is defective.	1. It is good if there is a continuity or not good if it is infinite. 2. Switching error	Trouble by shortcircuit	1. Visual check of fusing 2. It is fused if there is an infinite resistance.	1. It is defective if an infinite is detected at a place. 2. Miswiring if ZCT wire of slow-down unit is not passed	
Countermeasure	Load removal from power outlet.	Solenoid unit replacement	Slow-down unit replacement	1. Replace if it is infinite. 2. Turn the switch lever to ON side.	Replacement of shortcircuited section.	Fuse replacement	1. Lead wire replacement 2. Pass the wiring through ZCT of slow-down unit.	

• Engine can be started but unable to weld or generate power.

Phenomenon	Cannot weld but the auxiliary power supply can be used.	Can weld but the auxiliary power supply cannot be used.	Can weld and provide a powerful auxiliary power supply.			
Subject parts	Current adjusting variable resistor	Breaker	AVR Assy	Wiring	Current detecting transformer	Variable resistor
Possible cause	Broken wire	Internal trouble	Defective Assy	Broken wire	Broken wire	1. Improper adjustment of current adjustment dial 2. Shortcircuit on the circuit
Inspection	Check the resistance with a circuit tester.	Setting the breaker lever at ON position, check the continuity between terminals with a tester.	Replace with a new AVR Assy.	Check the resistance value on each lead wire with a circuit tester.	Check the resistance with a circuit tester.	1. Check the position of current adjustment dial. 2. Check the resistance with a circuit tester.
Judgement	It is good if the resistance is approx. $1\ \Omega$. It is not, if it is nearly infinite.	It is good if there is a continuity between terminals. It is not, if there is no continuity.	If it operates properly, the unit before replacement is defective.	It is good if there is a continuity between respective lead wires. It is defective if the resistance value is infinite.	It is good if the resistance is equal to the standard value of approx. $57\ \Omega$. It is defective if the resistance is infinite.	1. Current adjustment dial is set at a larger value (current). 2. It is good if the resistance is equal to the standard value of approx. $1\ \Omega$ It is defective if it is nearly in the conductive condition (close to $0\ \Omega$).
Countermeasure	Volume switch replacement	Breaker replacement	AVR Assy replacement	Lead wire repair or replacement	Current detection transformer replacement	1. Adjust the dial at the proper position. 2. Variable resistor replacement